

Study finds significant chemical exposures in women with cancer

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In a sign that exposure to certain endocrine-disrupting chemicals may be playing a role in cancers of the breast, ovary, skin and uterus, researchers have found that people who developed those cancers have significantly

higher levels of these chemicals in their bodies.

While it does not prove that exposure to chemicals like PFAS (per- and poly-fluoroalkyl substances) and phenols (including BPA) led to these cancer diagnoses, it is a strong signal that they may be playing a role and should be studied further.

The study showed that particularly for women, higher exposure to PFDE, a long-chained PFAS compound, had double the odds of a previous melanoma diagnosis; women with higher exposure to two other long-chained PFAS compounds, PFNA and PFUA, had nearly double the odds of a prior melanoma diagnosis.

The study appeared Sept. 17, 2023, in the [*Journal of Exposure Science and Environmental Epidemiology*](#).

The study showed a link between PFNA and a prior diagnosis of uterine cancer; and women with higher exposure to phenols, such as BPA (used in plastics) and 2,5-dichlorophenol (a [chemical](#) used in dyes and found as a by-product in [wastewater treatment](#)), had higher odds of prior ovarian cancer diagnoses.

The study was conducted by researchers from UC San Francisco (UCSF), University of Southern California (USC) and University of Michigan, all of whom are part of Environmental Health Sciences Core Centers.

They used data from blood and [urine samples](#) from more than 10,000 people in the National Health and Nutrition Examination Survey (NHANES). They investigated current exposure to phenols and PFAS in relation to previous [cancer](#) diagnoses, and explored racial/ethnic disparities in these associations.

"These findings highlight the need to consider PFAS and phenols as whole classes of environmental risk factors for [cancer risk](#) in women," said Max Aung, Ph.D., senior author of the study who conducted the research while at the UCSF Program on Reproductive Health and the Environment and now an associate professor of environmental health at USC Keck School of Medicine.

PFAS are ubiquitous in the environment

PFAS have contaminated water, food and people through products such as Teflon pans, waterproof clothing, stain-resistant carpets and fabrics, and food packaging. They are often referred to as "forever chemicals" because they are resistant to breaking down and therefore last for decades in the environment. PFAS also remain in people's systems anywhere from several months to years.

"These PFAS chemicals appear to disrupt hormone function in women, which is one potential mechanism that increases odds of hormone-related cancers in women," said Amber Cathey, Ph.D., lead author of the study and a research faculty scientist at the University of Michigan, School of Public Health.

The study also identified racial differences. Associations between various PFAS and ovarian and uterine cancers were observed only among [white women](#), while associations between a PFAS called MPAH and a phenol called BPF and [breast cancer](#) were observed only among non-white [women](#).

Researchers say EPA should regulate PFAS as a class of chemicals

"As communities around the country grapple with PFAS contamination,

this adds further evidence that supports policymakers developing action to reduce PFAS exposure," said Tracey J. Woodruff, Ph.D., MPH, UCSF professor and director of the Program on Reproductive Health and the Environment and director of the UCSF EaRTH Center, which supported the study.

"Since PFAS make up thousands of chemicals, one way to reduce exposures is for EPA to regulate PFAS as a class of chemicals, rather than one at a time."

More information: Cathey, A.L et al, Exploratory profiles of phenols, parabens, and per- and poly-fluoralkyl substances among NHANES study participants in association with previous cancer diagnoses, *Journal of Exposure Science & Environmental Epidemiology* (2023). [DOI: 10.1038/s41370-023-00601-6](https://doi.org/10.1038/s41370-023-00601-6)

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